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Swine plasma immunoglobulins for prevention and treatment of post-weaning diarrhoea: Optimizing stability towards gut conditions

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Post-weaning diarrhoea (PWD) is a common condition in intensive swine production, resulting in reduced welfare of weaners and economic losses for the farmer as a result of illness, death, and treatment costs. It is also one of the main causes of antibiotics- and zinc use in the pig production. We aim at developing products for protection against PWD based on natural antibodies (immunoglobulins) derived directly from inexpensive raw materials.

Swine immunoglobulins (Igs) were isolated directly from slaughterhouse swine plasma-waste by expanded bed chromatography. The immunoglobulin product is intended for enteral administration and thus has to pass through the digestive system, thus we consequently cross-linked the Igs by a periodate based method. The formation of high molecular weight complexes were demonstrated by size exclusion chromatography. By imitating the gastrointestinal system we subjected the Igs to pepsin or trypsin/chymotrypsin and observed the degradation patterns of the cross-linked Igs compared to unmodified Igs, and optimized coupling conditions to achieve maximal stability with concurrent retention of antigen binding activity. The availability of such an inexpensive, stable and highly active Ig product would allow swine producers to reduce expenses and cut down on antibiotics and zinc usage.